

Serial No. 09/955,368  
Page 9 of 16

### **REMARKS**

This response is intended as a full and complete response to the final Office Action mailed December 20, 2005. In the Office Action, the Examiner notes that claims 1-22 are pending of which claims 1-3, 6-12 and 14-20 are rejected and claims 4, 5, 13, 21 and 22 are objected to.

In view of the following discussion, Applicant submits that none of the claims now pending in the application are anticipated or obvious under the respective provisions of 35 U.S.C. §102 and §103.

It is to be understood that Applicant does not acquiesce to the Examiner's characterizations of the art of record or to Applicant's subject matter recited in the pending claims. Further, Applicant is not acquiescing to the Examiner's statements as to the applicability of the art of record to the pending claims by filing the instant response.

### **REJECTIONS**

#### **35 U.S.C. §102**

##### **Claims 1, 6-10, and 14-20**

The Examiner has rejected claims 1, 6-10, and 14-20 under 35 U.S.C. §102(e) as being anticipated by Whinnett et al. (U.S. Patent 6,317,411, hereinafter "Whinnett"). Applicant respectfully traverses the rejection.

Applicant maintains that Whinnett fails to teach or suggest each and every element of Applicant's invention of at least claim 1. Namely, Whinnett fails to teach or suggest at least the limitation of "wherein each transmit sequence of a particular transmit-sequence chain is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol-sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol sub-stream pair," as taught in Applicant's invention of at least claim 1. Specifically, Applicant's claim 1 recites:

"1. A method for use in a system adapted to transmit at least four series of transmit sequences over at least four transmit antennas, the method comprising the step of:

Serial No. 09/955,368

Page 10 of 16

space-time coding at least two pairs of symbol sub-streams, each of the pairs of symbol streams being space-time coded to form a respective pair of the transmit-sequence chains, the space-time coding being such that at least one of the formed pairs of the transmit-sequence chains is a function of symbols of the respective pair of symbol sub-streams and not a function of the symbols of the other pairs of the symbol sub-streams;

wherein each transmit sequence of a particular transmit-sequence chain is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol sub stream pair."

(Emphasis added.)

In the Office Action, the Examiner agrees that Applicant's matrices differ from those described by Whinnett, however, the Examiner maintains his rejection of claims 1-3, 6-12, and 15-20. In particular, the Examiner asserts that, since there is insufficient specificity with respect to the conjugation technique argued by the Applicant, Whinnett is interpreted as providing a conjugation technique that would read on the original or amended claims since there is no requirement for a particular matrix specified in the claim (Office Action, Page 2). Applicant respectfully disagrees.

Applicant maintains that there is sufficient specificity with respect to the transmit-sequence chains of the method of claim 1 to overcome Whinnett. As taught in Applicant's invention of at least claim 1, at least two pairs of symbol sub-streams are space-time coded where each of the pairs of symbol sub-streams is coded to form a respective pair of transmit-sequence chains. As such, although specific matrices are not claimed in Applicant's claim 1, Applicant respectfully asserts that the referenced portions Applicant's claim 1 identify at least four transmit-sequence chains. Furthermore, Applicant's claim 1 further defines characteristics of each of the transmit-sequence chains that are not taught or suggested in Whinnett.

Specifically, as taught in Applicant's invention of at least claim 1, each transmit sequence of a particular transmit sequence chain is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of

Serial No. 09/955,368  
Page 11 of 16

the respective symbol sub-stream pair. As such, although specific matrices are not claimed in Applicant's claim 1, Applicant respectfully asserts that Applicant's claim 1 sufficiently specifies characteristics of transmit-sequence chains that are completely different from any transmit sequence chain or associated matrix characteristics taught in Whinnett.

Rather, Whinnett merely teaches that either: 1) symbols from each sub-stream in a respective pair of symbol sub-streams are transmitted in a symbol sequence or 2) complex conjugates of symbols from each sub-stream in a respective pair of symbol sub-streams are transmitted in a symbol sequence. Whinnett is completely devoid of any teaching or suggestion that each transmit sequence of a particular transmit-sequence chain is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol-sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol sub-stream pair, as taught in Applicant's invention of at least claim 1.

In other words, Whinnett teaches that a transmit sequence is a function of a symbol of one of the symbol sub-streams of a symbol sub-stream pair and a symbol of the other symbol sub-stream of the symbol sub-stream pair. For example, as depicted in FIG. 5 of Whinnett, the transmit sequence transmitted over antenna 100 consists of the sequence  $S_1, S_1, S_2, S_2$ . This transmit sequence is only a function of symbols from each of the respective symbol sub-streams in the pair of symbol sub-streams. This transmit sequence taught in Whinnett is simply not a function of any complex conjugates of symbols of any symbol sub-stream. Whinnett is completely devoid of any teaching or suggestion of a transmit-sequence chain that is a function of both a symbol of one of a pair of symbol sub-streams and a complex conjugate of a symbol of another of a pair of symbol sub-streams, as taught in Applicant's invention of at least claim 1.

Similarly, Whinnett teaches that a transmit sequence is a function of a complex conjugate of a symbol of one of the symbol sub-streams of a symbol sub-stream pair and a complex conjugate of a symbol of the other symbol sub-stream of the symbol sub-stream pair. For example, as depicted in FIG. 5 of Whinnett, the transmit sequence transmitted over antenna 102 consists of the

Serial No. 09/955,368

Page 12 of 16

sequence  $-S_2^*$ ,  $-S_2^*$ ,  $S_1^*$ ,  $S_1^*$ . This transmit sequence is a function of the complex conjugates of symbols from each of the respective symbol sub-streams in the pair of symbol sub-streams. This transmit sequence taught in Whinnett is simply not a function of any symbols (i.e., non-complex conjugates) of any symbol sub-stream. Whinnett is completely devoid of any teaching or suggestion of a transmit-sequence chain that is a function of both a symbol of one of a pair of symbol sub-streams and a complex conjugate of a symbol of another of a pair of symbol sub-streams, as taught in Applicant's invention of at least claim 1.

In other words, Whinnett is completely devoid of any teaching or suggestion of any transmit sequence that is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol-sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol sub-stream pair, as taught in Applicant's invention of at least claim 1. Thus, the teachings of Whinnett are completely different from the teachings of Applicant's invention of at least claim 1. As such, Whinnett fails to teach or suggest each and every element of Applicant's invention, as arranged in the claim.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim" (Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added)). The Whinnett reference fails to disclose each and every element of the claimed invention, as arranged in the claims.

As such, Applicant submits that independent claim 1 is not anticipated and fully satisfies the requirements of 35 U.S.C. §102 and is patentable thereunder. Furthermore, Independent claims 10 and 20 recite features substantially similar to the features of claim 1. As such, for at least the reasons discussed above with respect to claim 1, independent claims 10 and 20 are also not anticipated by Whinnett and fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Serial No. 09/955,368

Page 13 of 16

As such, Applicant submits that claims 1, 10, and 20 are not anticipated and fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder. Furthermore, claims 6-9 and 14-19 depend, either directly or indirectly, from independent claims 1 and 10 and recite additional features therefor. As such, and for at least the same reasons as discussed above with respect to claim 1, Applicant submits that these dependent claims are also not anticipated and fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder. Therefore, Applicant respectfully requests that the rejection be withdrawn.

### **35 U.S.C. §103**

#### **Claims 2, 3, 11 and 12**

The Examiner has rejected claims 2, 3, 11 and 12 under 35 U.S.C. §102(e) as anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being unpatentable over Whinnett. Applicant respectfully traverses the rejection.

For at least the reasons discussed above with respect to claims 1, 10 and 20, Applicant submits that Whinnett fails to teach or suggest each and every element of Applicant's invention. Namely, Whinnett fails to teach or suggest at least the limitation of "wherein each transmit sequence of a particular transmit-sequence chains is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol-sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol-sub-stream pair," as taught in Applicant's invention of at least claim 1.

The Examiner asserts that that "Whinnett discloses substream pairs are complex conjugates and portions of the four transmit sequence chains are representable [where] each row of a matrix represents one transmit sequence of a different one of the transmit sequence chains (see column 6, lines 7-21 where this is interpreted as equivalent). Applicant's claimed invention appears to be an obvious variation of the orthogonal technique and would have been obvious to one of ordinary skill in the art." (Office Action, Pg. 4). The Applicant respectfully disagrees.

424731-1

Serial No. 09/955,368  
Page 14 of 16

For at least the reasons discussed herein with respect to claim 1, Whinnett is completely devoid of any teaching or suggestion of the limitation "wherein each transmit sequence of a particular transmit-sequence chain is a function of 1) a symbol of one of the symbol sub-streams of the respective symbol-sub-stream pair and 2) a complex conjugate of a symbol of the other symbol sub-stream of the respective symbol sub-stream pair," as taught in Applicant's invention of at least claim 1. Furthermore, there is no motivation whatsoever to modify the Whinnett reference. As such, Whinnett fails to teach or suggest Applicant's invention, as a whole.

As such, Applicant submits that claim 1 is not obvious over Whinnett and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder. Furthermore, independent claim 10 recites features substantially similar to the features of claim 1. As such, for at least the reasons discussed above with respect to claim 1, independent claim 10 is also not obvious over Whinnett and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder.

Furthermore, claims 2, 3, 11 and 12 depend, either directly or indirectly, from independent claims 1 and 10 and recite additional limitations therefor. As such, at least for the reasons discussed above with respect to independent claims 1, 10 and 20, Applicant submits that dependent claims 2, 3, 11 and 12 also are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

#### **ALLOWABLE SUBJECT MATTER**

Claims 4, 5, 13, 21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for indicating the allowable subject matter with respect to claims 4, 5, 13, 21 and 22. However, in view of the arguments set forth herein, Applicant believes that base claims 1, 10 and 20 (as well as all intervening claims) are in allowable form and, as such, dependent claims 4, 5, 13, 21 and 22, as they stand now, are therefore in allowable condition. Thus,

Serial No. 09/955,368

Page 15 of 16

Applicant respectfully requests that the foregoing objection to claims 4, 5, 13, 21 and 22 be withdrawn.

### **SECONDARY REFERENCES**

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to Applicant's disclosure than the primary references cited in the Office Action. Therefore, Applicant believes that a detailed discussion of the secondary references is not necessary for a full and complete response to this Office Action.

Serial No. 09/955,368  
Page 16 of 16

**CONCLUSION**

Thus, Applicant submits that none of the claims presently in the application are anticipated or obvious under the respective provisions of 35 U.S.C. §102 and §103. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Michael Bentley at (732) 383-1434 or Eamon J. Wall at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Dated: 2/3/06

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